Contents

Preface v

1. GENERAL THEORY

Unconventional superconducting properties of the high T_c oxides 1
G. Deutscher (Tel Aviv, Israel)

Understanding high temperature superconducting oxides 11
B. K. Chakraverty, M. Avignon and D. Feinberg (Grenoble, France)

Raman scattering as an analytical tool for high T_c superconductors 33
C. Thomsen, M. Cardona and R. Liu (Stuttgart, F.R.G.)

Magnetic properties of $BiSrCaCu_2O_x$ high-temperature superconductor 39
(S. Zannella, A. M. Ricca, V. Ottoboni, G. Ripamonti (Milano, Italy), F. Bolzoni (Parma, Italy) and P. Bossi (Milano, Italy)

The formation of high T_c $YBa_2Cu_3O_{7-\delta}$ by an oxygen refilling process on thin films made by r.f. magnetron sputtering 47
D. Abukay, M. Akinaga, G. Burri and L. Rinderer (Lausanne, Switzerland)

Influence of copper substitution by transition metals on local pair superconductivity in high-temperature oxides 51
J. Kasperczyk and M. Piasecki (Częstochowa, Poland)

2. STRUCTURE, NEW MATERIALS AND SUBSTITUTION

Structures and microstructures in the bismuth and thallium superconductors 59
M. Hervieu, C. Michel and B. Raveau (Caen, France)

Electron microscopic studies of high T_c superconductors 71
S. Amelinckx, G. van Tendeloo (Antwerp, Belgium), H. W. Zandbergen (Leiden, The Netherlands) and J. van Landuyt (Antwerp, Belgium)

Structure and conductivity of copper oxide based compounds 95
D. M. de Leeuw (Eindhoven, The Netherlands)

Order–disorder and superconductivity in Tl–Ba–Cu–O and lead-substituted Bi–Sr–Ca–Cu–O compounds 109
P. Bordet, J. J. Capponi, C. Chaillout, J. Chenavas, M. Godinho, A. W. Hewat, E. A. Hewat, J. L. Hodeau, A. M. Spieser, J. L. Tholence and M. Marezio (Genoble, France)

A homologous series based on YBaCuO, $Ba_{16}Y_8Cu_{24}C_{56-m}$ ($0 \leqslant m \leqslant 8$, m even) 117
M. A. Alario-Franco (Madrid, Spain), C. Chaillout, J. J. Capponi, J. Chenavas and M. Marezio (Grenoble, France)

Two new bulk superconducting phases in the Y–Ba–Cu–O system: $YBa_2Cu_{3.5}O_{7+x}$ ($T_c \approx 40$ K) and $YBa_2Cu_4O_{8+z}$ ($T_c \approx 80$ K) 129
J. Karpinski, E. Kaldis, S. Rusiecki, E. Jilek (Zürich, Switzerland), P. Fischer (Würenlingen, Switzerland), P. Bordet, C. Chaillout J. Chenavas, J. L. Hodeau and M. Marezio (Grenoble, France)

Potassium doping of $YBa_2Cu_3O_{7-\delta}$ 139
I. Kontoulis, X. Turrillas, R. Meisels, S. Bungre and B. C. H. Steele (London, U.K.)

© Elsevier Sequoia/Printed in The Netherlands

Microstructural study of YBaCuO in the presence of impurities 147
M. Mehbod, W. Biberacher, A. G. M. Jansen, P. Wyder (Grenoble, France), P. H. Duvigneaud and R. Deltour (Bruxelles, Belgium)

Physical and structural properties of the oxygen vacancy phases of $ErBa_2Cu_3O_x$ 153
E. Pörschke and P. Meuffels (Jülich, F.R.G.)

Comparison of the two orthorhombic–tetragonal transitions in iron-doped $Y_1Ba_2Cu_3O_y$.. 159
H.-U. Krebs and O. Bremert (Göttingen, F.R.G.)

The onset of oxygen diffusion in $YBa_2Cu_3O_{7-\delta}$: an investigation by neutron diffraction 167
S. Jantsch, J. Ihringer, J. K. Maichle, W. Prandl, S. Kemmler-Sack, R. Kiemel, S. Lösch, W. Schäfer, M. Schlichenmaier (Tübingen, F.R.G.) and A. W. Hewat (Grenoble, France)

Out- and in-diffusion of oxygen in $YBa_2Cu_3O_{7-x}$ oxide..... 177
G. Ottaviani, C. Nobili, F. Nava, M. Affronte, T. Manfredini (Modena, Italy), F. C. Matacotta (Milano, Italy) and E. Galli (Modena, Italy)

PAC-study on ^{111}In implanted into $YBa_2Cu_3O_7$ and constituent materials..... 185
M. Uhrmacher, A. Bartos and K. Winzer (Göttingen, F.R.G.)

Characterization of bulk superconducting high-temperature ceramics by very low field a.c. initial susceptibility..... 193
B. Loegel, A. Mehdaoui and D. Bolmont (Mulhouse, France)

Data on the $YBa_2Cu_3O_{7-x}$–CuO_x phase diagram 201
F. Licci (Parma, Italy), P. Tissot (Geneva, Switzerland) and H. J. Scheel (Lausanne, Switzerland)

High-pressure phase diagrams (1 - 3000 bar oxygen) of the (Y–Ba–Cu–O)–O_2 systems 207
J. Karpinski, E. Kaldis and S. Rusiecki (Zürich, Switzerland)

Quantitative detection of secondary phases in $YBa_2Cu_3O_{7-x}$..... 211
M. François and H. J. Scheel (Geneva, Switzerland)

Reproducible growth of large free crystals of $YBa_2Cu_3O_{7-x}$..... 219
W. Sadowski and H. J. Scheel (Geneva, Switzerland)

Structure and superconductivity of variously prepared Tl–Ca–Ba–Cu–O compounds..... 229
Gy. Kovács, I. Kirschner, I. Halász (Budapest, Hungary), R. Laiho (Turku, Finland), T. Porjesz, K. Tompa, T. Träger, T. Kármán and G. Zsolt (Budapest, Hungary)

Magnetic susceptibilities measured on ceramic high-T_c superconducting discs 241
J. Cornelis, J. Vansummeren, F. Biermans, H. Ooms, R. de Batist, L. Vandevelde, F. Servaes and A. van den Bosch (Mol, Belgium)

Procedures for synthesis of single-phase 2212 bismuth material 247
D. Beltrán, M. T. Caldés, R. Ibáñez, E. Martínez, E. Escrivá, A. Beltrán, A. Segura, V. Muñoz and J. Martínez (Valencia, Spain)

Crystal fibers of Bi–Sr–Ca–Cu–O materials grown by the laser floating zone method 253
G. F. de la Fuente (Herndon, VA, U.S.A.), D. Beltrán, R. Ibáñez, E. Martínez, A. Beltrán and A. Segura (Valencia, Spain)

High-T_c phase stabilization in Bi–Ca–Sr–Cu–O systems by lead doping..... 261
N. Brničević, P. Planinić, J. Veselić, M. Ćurić, M. Požek, A. Turković (Bijenička, Yugoslavia), R. Abt, E. Schweiger, V. Wippel, G. Leising, B. Stadlober and P. Knoll (Graz, Austria)

On the kinetics of superconducting phase formation in $Y_1Ba_2Cu_3O_y$ 269
H.-U. Krebs (Göttingen, F.R.G.)

Superconducting phases and influence of oxygen content in the $Bi_2Sr_2CuO_y$–$CaCuO_2$ system 277
S. Pekker, J. Sasvári, Gy. Hutiray and L. Mihály (Budapest, Hungary)

Characterization of the superconducting $Bi_2Ca_{3-s}Sr_sCu_{3+s}$ ($s = 1, 1.5, 2, 2.5$) oxides 285
J. Amador, M. T. Casais, C. Cascales, A. Castro, M. de Pedro, I. Rasines (Madrid, Spain), G. Domarco, J. Maza, F. Miguélez, J. Ponte, C. Torrón, J. A. Veira and F. Vidal (Santiago de Compostela, Spain)

Properties of the high T_c superconducting phases in the (Pb–Bi)–Sr–Ca–Cu–O family of compounds 291
J. Schneck, D. Morin, L. Pierre, J. Primot, J. C. Tolédano, A. Savary, C. Daguet, F. Glas and J. Etrillard (Bagneux, France)

$YBa_2Cu_3O_7$ preparation by the amorphous citrate method 299
P. L. Villa, S. Zannella, V. Ottoboni, A. Ricca, N. Ripamonti and M. Scagliotti (Milan, Italy)

Preparation of superconductors of the BiSrCaCuO system by glass crystallization 305
A. P. Conçalves, I. C. Santos, M. Almeida (Sacavem, Portugal), M. O. Figueiredo, J. Maia Alves, M. M. Godinho (Lisboa, Portugal), F. Costa and J. M. Vieira (Aveiro, Portugal)

Effect of the replacement of oxygen by chlorine on the properties of the superconducting ceramics $Y_1Ba_2Cu_3O_{7-\delta}$ 311
B. A. Tallerchik, A. O. Olesk, T. N. Egorova, V. V. Popov, R. V. Parfeniev, M. L. Shubnikov, D. V. Mashovets and D. V. Smirnov (Leningrad, U.S.S.R.)

AUTHOR INDEX 319

SUBJECT INDEX 321